Meeting Minutes- Upper Sacramento River Monitoring Project Work Team
March 12, 2008

U.S. Fish and Wildlife Service Office, Tyler Road, Red Bluff, CA

Meeting was initiated by Richard Corwin, Bureau of Reclamation, meeting coordinator.

INTRODUCTIONS

Meeting was attended by:

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AGENCY UPDATES

1) Doug Killam reported on the 2007 Escapement Summary into Selected Waterways of the Upper Sacramento River Basin.

Late fall Chinook salmon escapements (Dec 2006 to April 2007) in the mainstem were 15, 341. Winter-run (late April-early Sep) were 2,500 fish, down from @ 17,000 in 2006. Fall-run numbers are not good on the mainstem or in the Central Valley (CV). 2007 was one of the lowest years on record with few jacks. The forecast is not encouraging.

Tributaries had better numbers. Bear Creek fall-run had 140 which is a decent number. Cow Creek fall-run counted 2,044. Cottonwood Creek counted 1,250 which is a respectable number for this Westside tributary. Battle Creek counted 21,682. A summary of the CV fall-run- from 1952-2007 the lowest year on record was in 1999, 2007 is the second lowest year.

2) Kellie Whitton- Battle Creek
The Barrier Weir construction project is ongoing and should be completed this fall. The Barrier Weir adult trap began operation March 1 but when temps are over 60 degrees, the overhead video monitoring will occur.

We began the Battle Creek community study to look at the distribution of all species in Battle Creek prior to dam removal. The survey will be conducted 4 times between November of 2007 and December of 2008 the survey will be conducted four times. First round has been completed. The study includes snorkel surveys for pikeminnow, bass, and hardhead and distribution surveys for all other species. Distribution surveys are done at 19 sites throughout the drainage. We are also trying to determine which species of lamprey are present in Battle Creek and their distribution.

We will start our annual adult Chinook salmon snorkel survey in June as usual. We are currently conducting a paired marked recapture trial at the Upper Battle Creek Rotary Screw trap. The goal of the project is to determine whether hatchery fish can be used as surrogates for wild fish when determining trap efficiency. Early results indicate that the trap efficiency for hatchery fish is lower that naturally produced fall Chinook salmon. Jess Newton is leaving for Carlsbad-his position will be available- the program is down several employees.

3) Colleen Harvey-Arrison
2007 fall-run Chinook salmon
Clear Creek-4,129
Mill Creek-796
Deer Creek-508

2007 spring-run
Antelope Creek- 26
Mill Creek-920
Deer Creek-640

Both Mill and Deer Creeks have rotary screw traps that operate from late October thru late May. The purpose of this sampling is to monitor juvenile salmonid emigration for rear-real-time reporting of early detection of spring-run salmon entering the Delta. Rearing surveys are also used to determine relative size of known spring Chinook. Spring-run Chinook in Mill and Deer Creeks don't fit the traditional length-at-date charts used to classify juvenile salmon to run, so this real-time monitoring is used to predict occurrence of these fish in the Delta.

DFG is completing a 4 year study to correlate creek flows, critical riffle depth and fish passage in Mill Creek. The goal is to refine fish bypass flows, pulse flow events and critical riffle modification for effective fish passage for spring- and fall-run Chinook.

4) Jim Earley:Clear Creek- stream channel restoration 3B completed (river mile 2.7-3.4).
Ongoing Studies –

- Juvenile Habitat Use Study - to determine the effectiveness of restoration in creating juvenile habitat; started in February and will conclude in mid-April (4-reaches; 2 controls and 2 restoration sites) ~ 25 habitat units per reach.

- Mercury Studies - Is the restoration project contributing to mercury in the creek? Two winter storms were sampled and that data is currently being analyzed. If the opportunity presents itself we may sample again before the end of the rainy season.

- Invertebrate Studies – Comparing inverts in gravel injection sites as well as control sites. Phase 3A and 3B are also being evaluated during the study.

- Gravel study is continuing to be evaluated for effectiveness. A few additional gravel injection / placement projects are on the horizon and the details are currently being worked out. Projects will include construction of a riffle

- In early summer there will be an inventory of riparian encroachment and other restoration opportunities. Controlled releases from Whiskeytown

Reservoir contribute to channelization of stream and riparian encroachment.

- Mark Gard from Sacramento FWO is finishing the last portion of the IFIM study that incorporates the Red Bluff FWO Juvenile Habitat Suitability Index data. Study should be finished by early next year.

- Kayak surveys for *O. mykiss* are currently being conducted and have observed115 redds; last year there were 163 redds.

- Fall-run Chinook spawning area mapping is being finalized for 2007.

- Two screw traps were installed to measure juvenile production of spring, fall, and late-fall Chinook and steelhead. We will be collecting otoliths from juvenile *O. mykiss* for further analysis of Sr:Ca to better understand maternal anadromy.

Spring-run adult escapement numbers increased on Clear (194) and Battle (291) Creeks.

5) Bill Poytress- screw traps RBDD
There has recently been a reduction in the number of fall-run juveniles captured by the traps. In 2007- 10.5 million passed by this time, down from11.2 million in 2006 and 24 million in 2003. 2008 Fall-run numbers are 10 million wild juveniles passing RBDD to date which is similar to 2007 and 2006 values at this time of year. Program is funded through next year and sampling is scheduled to occur 7 days a week.

For 2008, a juvenile sturgeon egg and larval study (night larval sampling 40 river miles above and below the RBDD) will begin with UC Davis and Reclamation; currently waiting on State permits. The objectives of the study are to determine spawning locations and habitat preferences and possibly the upper extent of spawning areas in the Sacramento River for green sturgeon,. Deep water aggregation surveys using black and white video technology will be conducted to try and determine how many sturgeon are holding in areas. Locations to video will be based on the presence of acoustic-tagged fish.

6) Erin Chappell
Winter-run loss at the Delta Fish Facilities has stayed low this year.
Working on the Habitat Expansion Agreement between PG&E and DWR to increase spawning and holding habitat for spring-run and steelhead in the Sacramento Basin.

7) Kurt Brown-Coleman Hatchery
10,600 fall-run handled
5,800 late-fall-run “

2000 steelhead “

Late-fall fish are still hatching out; collected eggs are in the ponds

Two releases at the RBDD-Clarksborough, 50,000

Livingston Stone- delta smelt; no ripe females yet. Collected more winter-run this year (18) so far as compared to last year’s total of 36.

8) Central Valley Creel
Knights Landing to Anderson 6,500 fish harvested, 17,000 CV wide; lowest harvest on record

9) Tim Hamaker, CH2MHill
Working for TCCA; design studies for 2,300 cfs RB pumping station and fish screen; waiting on the ROD

Wilkins Slough; hydraulic performance; Tillsdale Weir evaluation

10) Mike Berry- DFG
NMFS, DFG and FWS have written a letter to Reclamation supporting the 12 months gates out at the RBDD

Cow Creek drainage- $2 million to remove barrier and put in pumps; final review is with the Science Advisory Board. There are three other diversions on Cow Creek; would open up 40 miles of stream if the diversions were laddered.

Judge Carr Powerhouse, Spring Creek tunnel could put 3500 cfs down the glory hole to sustain restoration.

Battle Creek- two phases. North Fork-open up 17 miles, remove Wildcat Dam with various screens and ladders; increased flow to the river. Battle Creek has responded to interim increased flows. Best fishing hole: upstream of the BLM property line.

11) UC Davis
Juvenile green sturgeon work is being conducted- mobile tracking of two Reclamation–reared sturgeon; spatial movements throughout the delta. Also will be tagging five adult green sturgeon; collaboration with Reclamation; identification of courting behavior for spawning locations

Eric Chapman
Quarterly telemetry downloads for fish that have made it above the RBDD; more fish, steelhead and late-fall have made to the Golden Gate Bridge

12) Joe Silveira

La Barranca Unit- levee breech and old gravel mine regarding is planned for floodplain restoration this summer; NEPA/CEQA was funded by the AFRP and construction is funded by California DWR.

13) Trinity River Restoration with Reclamation- Clear Creek; increasing recreational use

14) George Edwards- samples of resident Sacramento River populations provided by FWS.
Deer Creek- large portion of steelhead progeny. Yuba-resident fish collected; not many steelhead. E-mail George for copy of the report. Another ongoing study- genetics of various rivers.

15) Kevin Offill - Hatchery Evaluation; Keswick Trap: kept 18 winter Chinook for brood stock so far; Livingston Stone NFH: used heaters to encourage sexual maturation in delta smelt; four females have been spawned, delta smelt reared in separate building; Coleman NFH: steelhead – 7 acoustic tagged repeat spawn STT returned from 35 released last year, Bio-sampling - 6,100 hatchery late-fall Chinook (one of best hatchery returns); natural numbers are low (approx 30).

Winter Chinook spawning escapement survey will continue this summer (winter Chinook trapping at Keswick, while early, is promising for an increased run size compared to 2007); Fall-run Chinook video operations with Doug Killam starting in September; Bio-sampling operations for fall and late-fall Chinook and steelhead at Coleman NFH starting October.

16) Sites Reservoir- funding issues; Kramer and Associates are working on a model for various runs.

17) Jack Ingram- Stockton Fish and Wildlife Office

Delta Juvenile Fish Monitoring Program's updates for CHN yearly catch (all races) for Mossdale, Sacramento and Chipps Island trawls:

Mossdale (RM 54):
5 year trend is down - slight increase in catch from 2006 to 2007

Sacramento (RM 55):
5 year trend is down - increase in 2007 catch after a large fall off in catch in 2006.

Chipps Island:
5 year trend is down - large fall off in catch in 2007. Due to restricted DSM take and the presence of mature DSM, trawling operations were moved from Chipps Island to Benicia from February 8 to March 8. Trawling resumed at Chipps Island (reduced from 3 days to 2 days per week) on March 10. A study design to compare trawl efforts at Chipps Island and Benicia is in development.

PRESENTATIONS

1) Doug Killam-Video Station Counts from 2003-2007
Traditional carcass counts provide similar information to the video station counts. Carcass surveys showed 151,479; v.s.c showed 152,530.

V.s.c provide instream estimates of salmon/steelhead moving through' this avoids having to conduct carcass surveys/traps. Problems with surveys is that you need permission from individual landowners; v.s.c allows you to monitor the creek at one location, avoiding having to contact all landowners on the system.

Battle Creek-2005; a convection picket weir was used. In 2006 a vertical picket weir was used (picket weir discontinued because it collected too much debris). The video station was reliable alternative to the carcass survey; carcass survey discontinued.

Cow Creek- new station in 2006. 1984 was the last salmon count on Cow Creek. Data was collected quickly and at a low cost. Average for all years, 2,611.

Criteria for new v.s.c site selection:
1) needs to be downstream of spawning areas
2) need clear, smooth flowing water; turbid water gets poor results
3) need access for vehicles, away from public traffic and permission to access 7 days a week.
4) Need access to a power supply; if not, solar power can be used. The Battle Creek station had solar power of a cost of $10K.

In 2007 there were video monitoring stations on Cow Creek, Bear Creek (small tributary with a 140 count), Battle Creek, Cottonwood Creek.

Steelhead counts were conducted on Antelope and Mill Creeks. Antelope Creek-in since Dec, of 2007. 100 steelhead and rainbow trout (>18" trout are being called steelhead; steelhead are long and torpedo shaped; resident trout are short and football-shaped) were counted so far.

Ditson used for ground truthing.

All stations have underwater cams to identify species. Stations are removed when storms are expected (>1800 cfs).

There is experimentation with low end DVR and video tapes. Three tapes are needed per day for the season. Motion filtered.

2) Chris Eilers-Central Valley steelhead plan

Pacific States have contracted with DFG for a steelhead monitoring plan. The plan is needed because current monitoring is inadequate; just measures presence/absence which is not enough information in the Central Valley.

We are trying to standardize methods to develop online data base for CV; with contact info. Good data is needed; there is no idea if steelhead populations are viable and if they should be delisted.

Website: CALFISH.org; Programs and Projects; paper on the monitoring plan-1st draft completed. Plan is broken down by rivers in the C.V. A monitoring biologist position is opening up- the goal is to identify all sites in the C.V. where monitoring is needed. Project should be completed by June of 2009.

3) Alicia Seesholtz- Green Sturgeon on the Feather River

Historic range is unknown. Sturgeon believed uncommon in the Feather; are thought to occur only at high flow events. Spawning has never been accurately documented. Screw traps never successfully sampled sturgeon. There have been attempts to capture sturgeon to apply telemetry tags. A counting weir may be in operation this year. How are sturgeon related to the rest of the C.V. population? Samples will be sent to U.C. Davis (no samples sent to date).

How do Oroville facilities impact the sturgeon? There are three potential barriers on the Feather. River Mile (RM) 25 (Shanghai Bend) is a natural barrier; RM 38.5 (Sunset Pumps) is a man-made barrier; RM 61 is a low flow channel that does not pose a passage issue. Shanghai Bend was evaluated and determined to be passable at high flows. Sunset Pumps is not passable but there may be a potential passageway on the left side at high flows.

DWR has conducted studies in the past; in 2003 there were angling surveys, scuba surveys, egg and larval surveys- no sturgeon were detected. In 2004 there were angling surveys and fyke traps. Sturgeon were detected breaching for a ten day period. 2006 had the highest number of sturgeon counted (16) via a creel survey from May-July. First observation was in April by Gridley with a 240 pound fish- biggest observed. In July were larval surveys-nothing was sampled but there were observation of several sturgeon caught near the outlet.

Hydrograph- date vs. mean daily flow. In January flows in the Feather are greater than those in the Sacramento River; from March-April flows are similar to the Sacramento.

In 2007 from May-August gill and trammel nets were used to catch sturgeon-none sampled. Fyke traps were used May-July-no sturgeon sampled.

Between angling surveys, sightings and carcasses, it is determined that sturgeon are in the Feather River and are there independent of flows year-round. In 2008 there will be a focus on angling and an attempt to use trott lines(pilot study) and high definition imagery mapping. Also deploying 35 Vemco receivers. Other possibilities could include use of gill/trammel nets and a counting weir.

Low numbers of sturgeon are not uncommon; numbers increase during high flow years. Numbers detected from local bait shop information, creel surveys, biologist sightings.

Other studies in 2008: telemetry; spring-run tagging at the hatchery; redd dewatering/stranding surveys…

White sturgeon-uncommon; they usually occur lower in the system.

4) Robert Chase- Acoustic Tracking of Green Sturgeon in the Sacramento River

Goal is to monitor previously tagged green sturgeon above and below the Red Bluff Diversion Dam using Vemco VR-100 and VR2 stationary receivers.

Green sturgeon were monitored with mobile and stationary acoustic receivers on the upper Sacramento River between RKM 415-506. A total of five green sturgeon were detected in the upper Sacramento River between the months of April and December. Of the five green sturgeon detected in the river, three of those five passed upstream of the RBDD prior to the first gate closure on May 3rd and successfully passed downstream under the gates.

Four of the five green sturgeon were detected at RKM 459 with one female showing residency of six months.

All tagged green sturgeon had left the system by January 2008.
Other studies (recommendations): Increase tracking with the VR-100 in the Sacramento River; deploy more VR2s above and below the RBDD; and put more tagged fish in the river.

Acknowledgements- UC Davis, NOAA Fisheries and WDFW.

5) Joe Silveira (USFWS-Sacramento River NWR) Bank Swallow (*Riparia riparia riparia*) Population and Habitat Trends Along the Sacramento River, Red Bluff to Colusa.

The bank swallow is a California threatened species with over 54% of the breeding population located along the eroding banks of the Sacramento River between Red Bluff and Colusa (RM 243–RM 143. DFG began population surveys, reproductive studies, colony and habitat assessments on the Sacramento River in 1986 and expanded this effort State-wide in 1987. Breeding pairs surveys have been conducted along the Sacramento River since 1986, nearly 21 consecutive years Populations declined from a high of 13,170 pairs in 1986 to a low of 4,900 in 1998. The populations has slightly increased, in a fluctuating manner, to 9,070 pairs in 2007; however 8 of the 38 total colonies contained 49% of the population, showing a trend of fewer, larger colonies. This makes the risk of stochastic extirpation/extinction much greater. The cause for population declines is habitat reduction through bank revetment (e.g., levees, rip-rap, rubble). Over 48% of the cut-banks along the Sacramento River between Red Bluff and Colusa have been armored.

Habitat is ephemeral with it continuously being lost and created through channel migration and floodplain reworking. Typical habitat consists of sand, silt and clay loams, with <80% slope and bank height of 4-24 ft.

Restoration and management activities at Sacramento River NWR includes rock and levee removal at the Flynn Unit, which resulted in 2,770 nesting pairs (at that time the second largest colony recorded from the annual survey). A 140-acre grassland restoration at the Pine Creek Unit provides abundant insect prey for that colony. The Refuge has been a cooperator on the annual survey since 1989, providing boat, operator, and staff to assist DFG with the survey.

DFG is considering a change of status to endangered species and expanded surveys, monitoring and research investigations. A landscape analysis of population and colony status and trends associated with bank revetment trends and other landscape features (e.g. bank sinuosity) is being conducted at CSUChico in cooperation with DFG-State Office, DWR-Northern District Office and the Refuge. DFG has formed a working group to address potential short and long range solutions to the population and habitat declines.

The bank swallow is a focal species for the Riparian Habitat Joint Venture. It is an excellent terrestrial indicator species for Sacramento River fluvial geomorphic processes and for this reason TNC selected the bank swallow as an indicator for the Ecological Flows Tool Study.

6) Bill Poytress-Abundance, Seasonal and Temporal Distribution Patterns of Age-0 Sturgeon Captured by Rotary-screw Traps at the Red Bluff Diversion Dam.

The rotary trapping operation began capturing larval sturgeon in the summer of 1995 as a non-target species as the project was designed to capture age-0 Chinook outmigrants. Larval sturgeon have been captured in each year of operation, but field identification has been an issue as most fish are less than 50mm TL. Larval fish were sent to UC Davis in 1996 and 1997 and all were grown out and positively identified as green sturgeon, *Acipenser medirostris*. Over the years all fish positively identified have been green sturgeon exclusively. Overall from the rotary trapping we have found:

- A discrete pattern of emigration between May and mid-August with 87% of annual captures occurring in June and July.
- 99.4% of captures occurred during the RBDD gates lowered sampling period
- Analysis of horizontal distribution patterns indicate that juvenile sturgeon emigrate primarly in the mid-channel habitat
- Annual relative abundance pattern suggests a negative trend for the period 1995-1999 and a more static trend between 2002 and 2006.

Overall, RBDD sampling captures a variable and undetermined proportion of sturgeon spawning in the Sacramento River annually. Abundance data is not indicative of the entire population. Data only represents offspring of those that were able to pass above the RBDD gates before annual spring gate closure which is likely variable between years.

Next Meeting was tentatively agreed upon to be on Wednesday March 18, 2009 at the USFW Red Bluff Field Office and will be organized by Bruce Oppenheim from NMFS.